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6.4 AGRICULTURE AND SOILS

This section describes the agriculture and soil resources in the vicinity of the Site. Based on the size and nature of the Project and other factors described in this section, the Project will have an incremental impact on agriculture and soil resources that will be less than significant. The Site will occupy land that is designated and zoned industrial and located in an area planned for industrial park development by the City of Avenal. Agricultural practices on lands adjacent to the Site will not be affected by the construction or operation of the Project, except for water conservation measures that have been volunteered by the owner/operator of the surrounding lands to offset groundwater that will be pumped from existing wells for the Project backup water supply (see Section 6.5 - Water Resources).

Beneficial aspects of the Project relative to agriculture and soils are:

- The Project will be located in an area that is designated and zoned industrial by the City of Avenal. There will be no conversion of land that is designated or zoned for agricultural use.
- The Project is not located on Williamson Act Lands.
- The Project has been designed in consultation with the owner/operator of the agricultural lands adjacent to the Site.
- Project design features assure that ground-level concentrations of air pollutants will have no significant impacts on agriculture and soil resources (see Section 6.2 - Air Quality).
- The Project will provide additional electrical power to assure a reliable supply of energy for California's agricultural and other uses.

6.4.1 EXISTING CONDITIONS

The Project area is located on the west side of the San Joaquin Valley, about 200 miles north of Los Angeles and 200 miles south of San Francisco. The area is characterized by rolling hills (Kettleman Hills) to the west and the plains of the San Joaquin Valley to the east. The climate is cool in winter, and hot and dry in summer. Average rainfall is between 6 and 7 inches per year.

Despite the dry climate, the San Joaquin Valley has become one of the most productive agricultural regions in the world. Agricultural productivity has been achieved by the development of water from ground and surface sources, irrigation facilities, and an engineered system of water storage and transport. In the Site region, agricultural water supply is obtained primarily from the California

Aqueduct (San Luis Canal) that passes near the Site, and from deep groundwater wells. Lands surrounding the Site are predominantly in agricultural uses typical of the region.

6.4.1.1 Soil Resources

Maps prepared by the United States Department of Agriculture (USDA), Soil Conservation Service (SCS), identify soil types and their distribution in the Project area (USDA, 1986). The Project is located in an area of gently sloping and relatively featureless topography. Soils are derived from erosion of the uplands to the west. The entire Site and much of the surrounding land is Wasco sandy loam. A second type of soil, Milham sandy loam, occurs within linear corridors planned for water pipeline and natural gas interconnections. The distribution of these soils in the Project vicinity is shown in Figure 6.4-1. The characteristics of these soil types are summarized in Table 6.4-1.

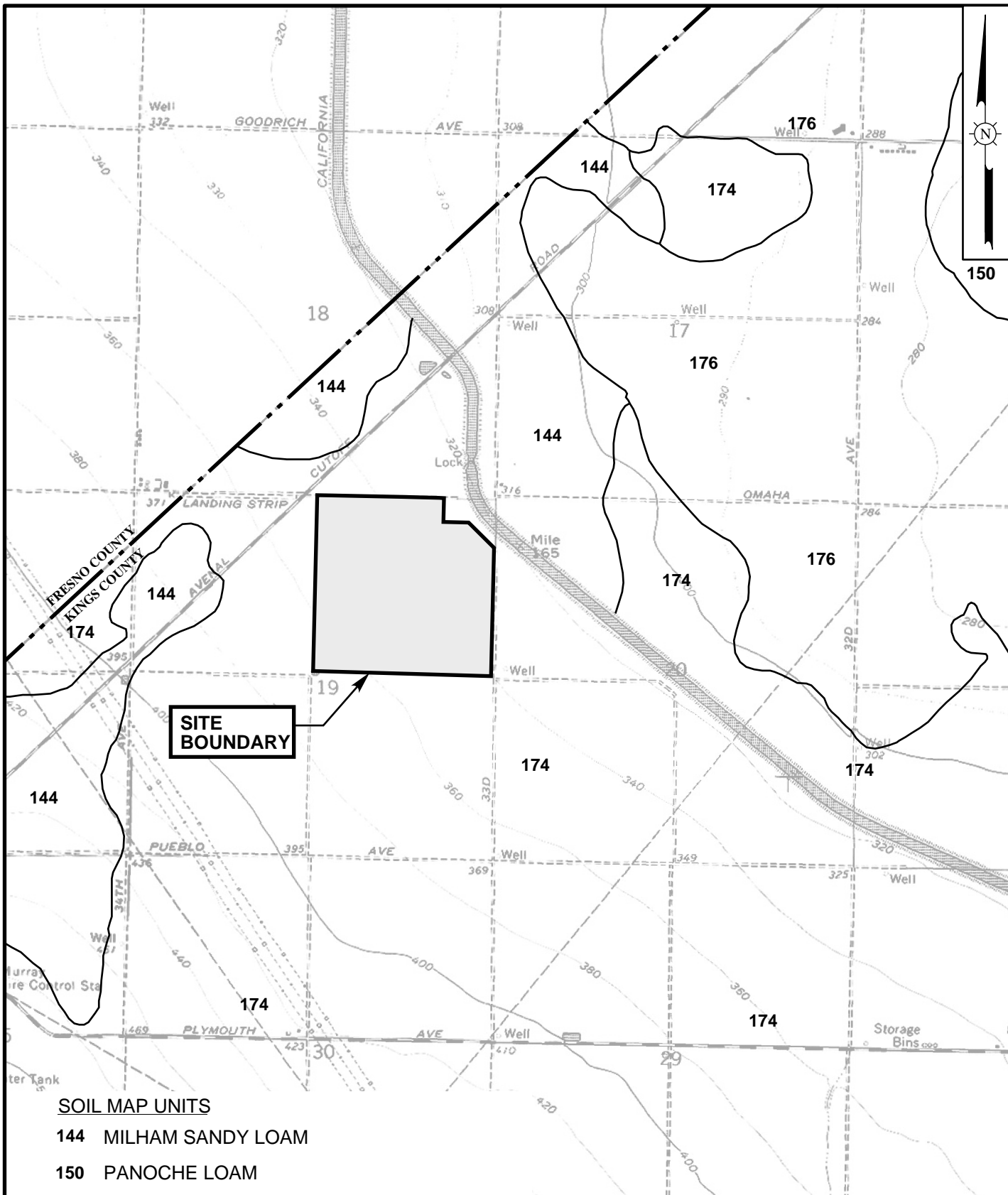
Wasco sandy loam (map symbol 174 on Figure 6.4-1) is a very deep, well-drained soil found on alluvial fans and derived primarily from sandstone. The permeability of this soil is moderately rapid, and available water capacity is low to moderate. This soil unit has the characteristics of a silty sand, with its moderately rapid permeability and good drainage. This soil covers the entire Site and does not present any significant hazard to Site development.

The Milham sandy loam (map symbol 144 on Figure 6.4-1) is also a very deep, well-drained soil found on alluvial fans. Unlike the Wasco soils, the permeability of this soil is slow, and available water capacity is high to very high. This soil has the characteristics of a silty sand in the upper horizon, with clayey sand, silt and clay in the lower horizons. This soil type does not present any significant hazard to development of the linear facilities that will occur within this soil unit.

Both the Wasco sandy loam and the Milham sandy loam soil units have characteristics that meet the soil characteristics of Prime Farmland.

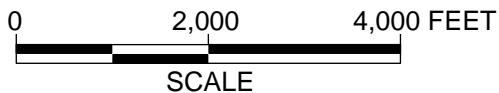
6.4.1.2 Agriculture and Prime Farmland

The San Joaquin Valley is a major agricultural region of California. Cropland, orchards and vineyards comprise most of the land in the Site area. The Site is farmed with row crops. Adjacent lands are mostly first-year orchards (planted 2001) with trees generally 3 to 5 feet in height. Mature orchard trees to 30 feet in height occur northwest of the Site on the other side of Avenal Cutoff Road. The vineyard closest to the Site is in the southwest quarter section of Section 17, east of the aqueduct.



SOIL MAP UNITS

- 144 MILHAM SANDY LOAM
- 150 PANOCHÉ LOAM
- 174 WASCO SANDY LOAM
- 176 WESTHAVEN LOAM



REFERENCE:

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, SOIL SURVEY OF KINGS COUNTY, CALIFORNIA, LA CIMA QUADRANGLE, 1986.

SOIL UNIT LOCATION MAP

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FIGURE 6.4-1

TABLE 6.4-1
SUMMARY OF POTENTIALLY AFFECTED SOIL TYPES AND CHARACTERISTICS

MAP SYMBOL ⁽¹⁾	SOIL NAME	% SLOPE	DEPTH (inches)	USDA TEXTURE	USCS CLASSIFICATION ⁽²⁾	EROSION FACTORS ⁽³⁾		PERMEA- BILITY	DRAINAGE	EROSION HAZARD RATING	LAND CAPABILITY ⁽⁴⁾
						K	T				
144	Milham Sandy Loam	0-2	0-14	Sandy Loam	SM	0.32	5	Slow	Well Drained	Slight	IIs-3 (17) Irrigated; VIIs (17) Nonirrigated
			14-32	Loam, Sandy Clay, Loam	CL, SC	0.28					
			32-60	Silty Clay Loam	CL, ML	0.32					
174	Wasco Sandy Loam	0-5	0-20	Sandy Loam	SM	0.32	5	Moderately Rapid	Well Drained	Moderate	IIe-4 (17) Irrigated; VIIe (17) Nonirrigated
			20-60	Sandy Loam, Fine Sandy Loam	SM	0.32					

31161/Rpts/AFC/Tbls&Figs (9/23/01/rm)

Source: U.S. Department of Agriculture, 1986.

-- Not available.

- (1) Soil numbers refer to numbers shown in Figure 6.4-1.
- (2) Unified Soil Classification System.
- (3) K is a measure of relative susceptibility to sheet and rill erosion by water. It ranges from 0.02 to 0.69, with lower values representing a lower susceptibility to erosion. T represents soil loss tolerance, defined as the maximum amount of erosion at which the quality of the soil as a medium for plant growth can be maintained. Values range from 1 to 5 (tons per acre per year), with 5 representing soils less sensitive to degradation.
- (4) An indication of the suitability of soils for most kinds of field crops. Capability classes are I through VIII. Subclasses are letters e, w, s, or c. Units are 0 through 9.

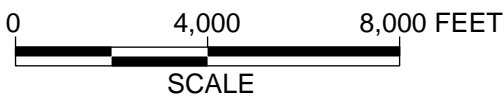
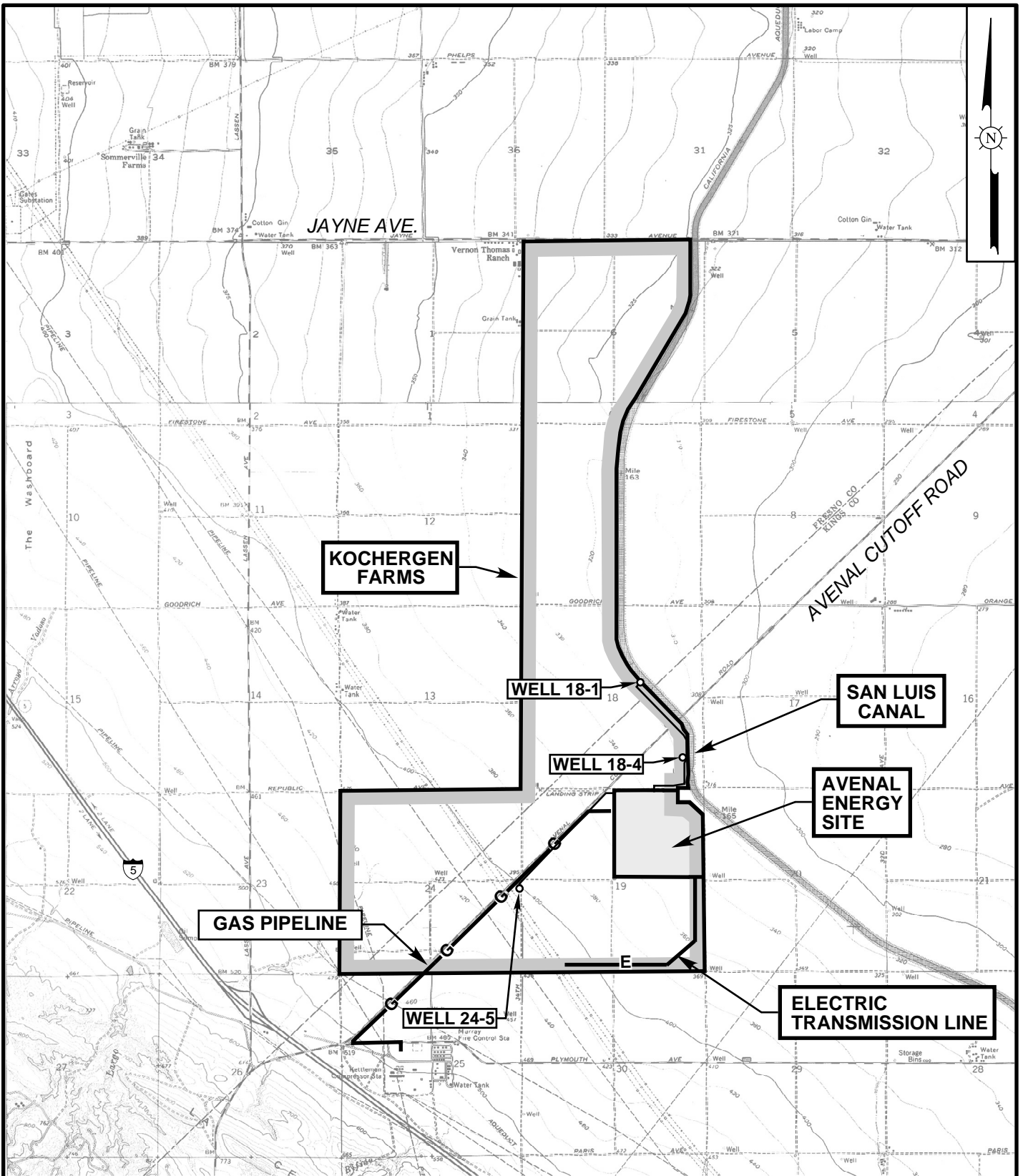
The Site and linear facilities will occur on lands within the boundaries of Kochergen Farms, which comprise more than 2,000 acres along the west side of the San Luis Canal (Figure 6.4-2). The natural gas line interconnection will extend outside of the Kochergen Farms property along existing city roads and the right-of-ways and will not affect agriculture. The crop types and irrigation systems in use are shown in Figure 6.4-3. Kochergen Farms does not employ any special cultivation practices (Kochergen, 2001). The existing groundwater wells that will provide a backup water supply for the Project are owned and used by the farm. Section 6.6 of this AFC, Biological Resources, includes a map of agricultural crops within a broader distance, including all lands within 1 mile of the Site.

The Site is located near the northeasternmost corner of the City of Avenal. Site soils meet the soil criteria for Prime Farmland, but the Site is zoned industrial. The Project will be part of the City's planned industrial park that has been sited, in part, to take advantage of access to nearby Interstate 5 and the Kettleman compressor station (City of Avenal, 1992). The industrial zone encompasses City lands southeast of Avenal Cutoff Road. Lands northwest of Avenal Cutoff Road, and lands outside the City limits, are Prime Farmlands. Williamson Act contract lands also occur in these areas (Figure 6.4-4). The only Project feature that will occur on Prime Farmland or Williamson Act contract land is the water pipeline to the existing water wells located north of the Site. This pipeline will be buried at the edge of the farm field just outside the canal right-of-way and will not impact agriculture. There are no Farmlands of Statewide Importance in the Site vicinity. The closest Unique Farmlands are located near Interstate 5, south of the Kettleman compressor station (Figure 6.4-4). Neither Unique Farmlands nor Farmlands of Statewide Importance will be affected by the Project.

6.4.2 IMPACTS

Significance criteria were determined based on CEQA Guidelines, Appendix G, Environmental Checklist Form (amended December 1, 1999), and on performance standards or thresholds adopted by responsible agencies. An impact may be considered significant if the Project results in:

- Substantial soil erosion or loss of topsoil.
- Substantial conflict with agricultural activities in the Project area.
- Conversion of Prime Farmland, or Farmland of Statewide Importance, to nonagricultural use.
- Conflict with existing zoning for agricultural use or a Williamson Act contract.
- Changes that could individually or cumulatively result in loss of lands zoned for agriculture to nonagricultural use.



REFERENCE: U.S.G.S 7.5 MINUTE TOPOGRAPHIC SERIES MAPS
OF HURON, CALIFORNIA, DATED 1971,
AND LA CIMA, CALIFORNIA, DATED 1978.

KOCHERGEN FARMS

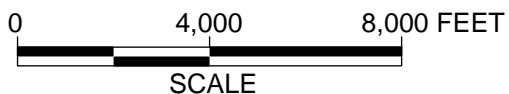
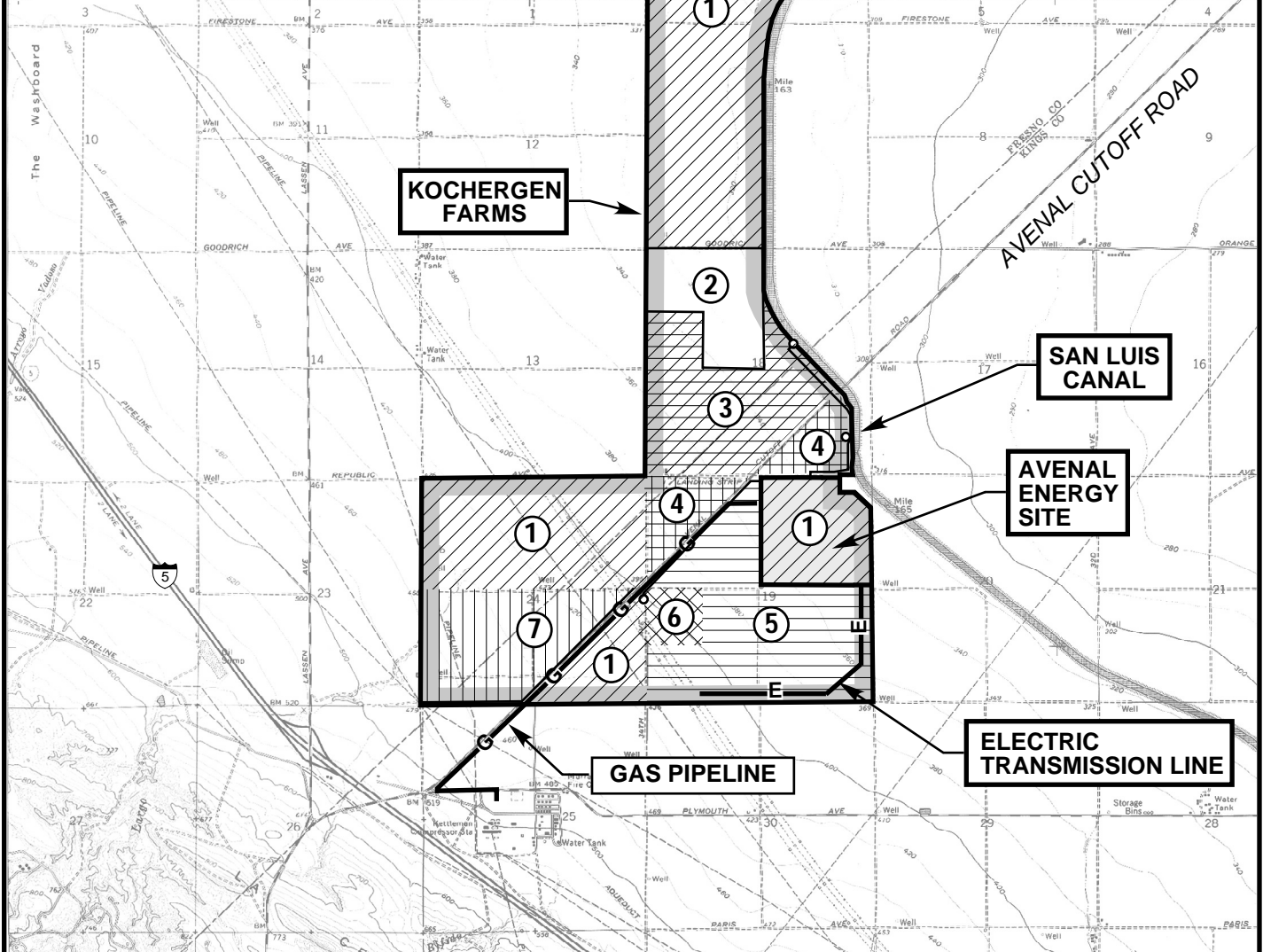
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FIGURE 6.4-2

AREA	CROP TYPE	IRRIGATION
1	Row crops (rotating crop types, mostly cotton and tomatoes)	Sprinklers (3 AF/AC)
2	Almond Orchard	Flood (3.25 AF/AC)
3	Almond Orchard	Sprinklers (3.25 AF/AC)
4	First-Year Almond Orchard ⁽¹⁾	Microsprinklers (2.75 AF/AC)
5	First-Year Almond Orchard ⁽¹⁾ with row crops	Drip/Sprinklers (>3.25 AF/AC)
6	Agricultural Composting	Not Applicable
7	Orange Grove	Microsprinklers (2.75 AF/AC)

⁽¹⁾ Planted 2001.



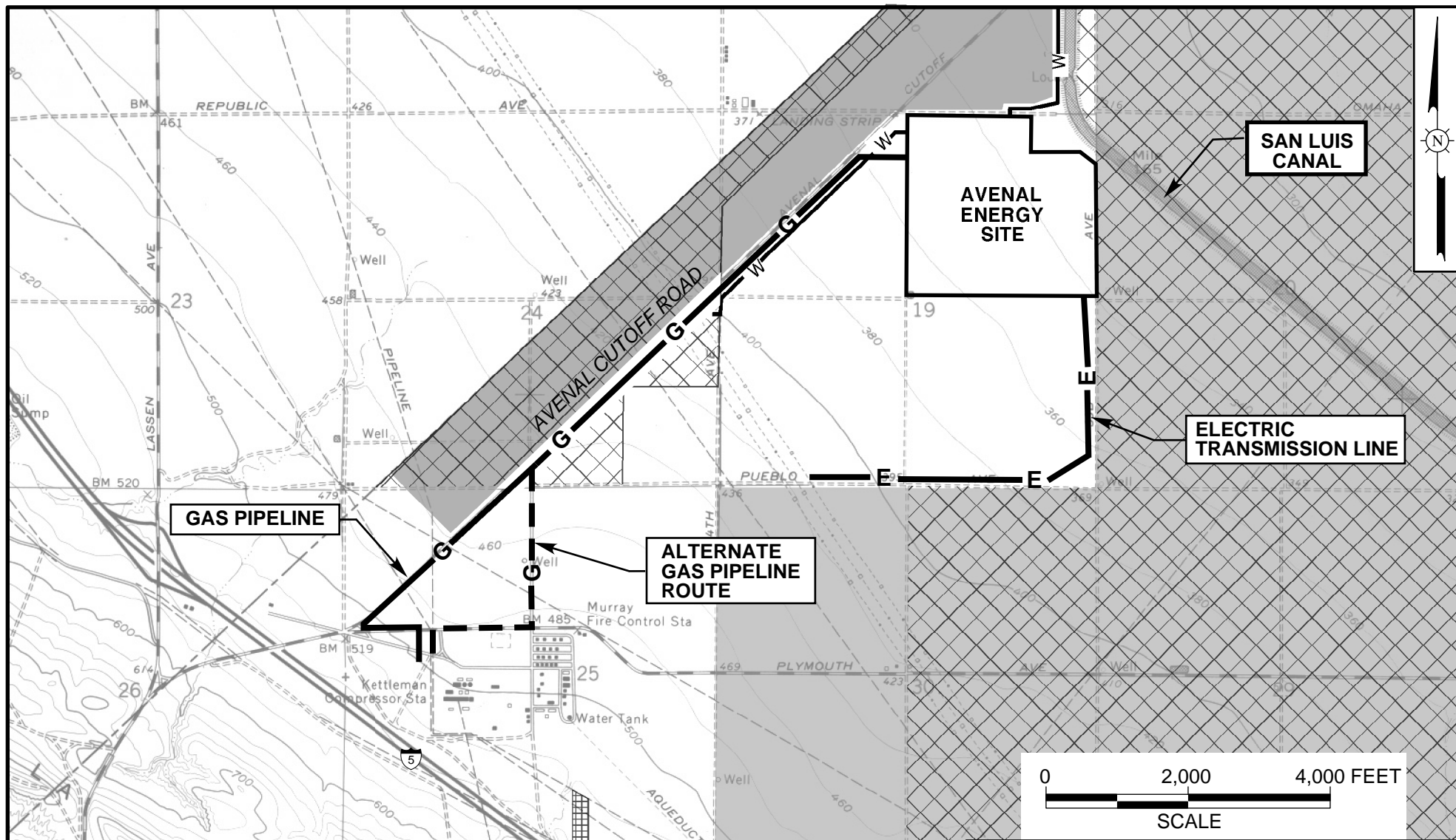
REFERENCE: U.S.G.S 7.5 MINUTE TOPOGRAPHIC SERIES MAPS
OF HURON, CALIFORNIA, DATED 1971,
AND LA CIMA, CALIFORNIA, DATED 1978.

AGRICULTURE CROP TYPES AND IRRIGATION SYSTEMS

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FIGURE 6.4-3



NOTE:
THERE ARE NO FARMLANDS OF STATEWIDE IMPORTANCE WITHIN THE MAP AREA. THE INDUSTRIAL ZONED AREA WITHIN THE CITY OF AVENAL IS NOT DESIGNATED AS PRIME FARMLAND IN THIS MAP DUE TO THE INDUSTRIAL ZONING.

SOURCES:

1. WILLIAMSON ACT LANDS FROM MAP PROVIDED BY KINGS COUNTY PLANNING AGENCY, OCTOBER 2, 1998.
2. PRIME AND UNIQUE FARMLANDS FROM IMPORTANT FARMLAND MAP, DEPARTMENT OF CONSERVATION, FARMLAND MAPPING AND MONITORING PROGRAM, LA CIMA QUADRANGLE, 1998. (FRESNO COUNTY NOT INCLUDED)

REFERENCE: U.S.G.S 7.5 MINUTE TOPOGRAPHIC SERIES MAP OF LA CIMA, CALIFORNIA, DATED 1978.

LEGEND

	WILLIAMSON ACT CONTRACT LANDS
	PRIME FARMLANDS
	UNIQUE FARMLANDS

0 2,000 4,000 FEET
SCALE

**WILLIAMSON ACT PARCELS
AND UNIQUE FARMLANDS**

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FIGURE 6.4-4

6.4.2.1 Construction Impacts

Project construction will include excavation, grading, equipment laydown, plant construction, interconnection construction and other necessary activities. Parking, laydown and construction activities at the Site are expected to encompass approximately 76 acres of the 148-acre Site during peak construction. This includes approximately 25 acres that will be occupied by facilities when construction is completed.

Project design features will reduce windblown dust during construction, through moisture-conditioning of soils during grading and application of water on roads and active laydown areas (see Section 6.4.2.4). The potential for soil erosion will be minimized through implementation of Best Management Practices (BMP) in accordance with the state NPDES General Permit for Stormwater Discharges From Construction Sites (Water Quality Order 99-08-DWQ). As a result of dust control measures and erosion BMPs, the short-term construction impacts of dust and erosion will be less than significant.

The Project is being designed to balance the amount of cut and fill during construction (see Section 2.3.18). Therefore, it is expected that only minor imports of select material (e.g., aggregate for base material) will be required. No export of excess soil is expected.

6.4.2.2 Operations Impacts

Following construction, the Site will operate with BMPs to minimize erosion in accordance with the state NPDES General Permit for Stormwater Discharges Associated With Industrial Activities (Water Quality Order 97-03-DWQ). With BMP measures employed, the impact of the Project related to erosion of soils will be less than significant. Appendix 6.4-1 provides a wind and water erosion soil loss calculation that shows implementation of the Project will cut soil loss approximately in half compared to existing conditions.

The Project design returns a portion of the 148-acre Site to agricultural use following construction as part of the landscaping plan (see Section 6.13). Orchards will be farmed in the northwest quarter of the Site between the plant and Avenal Cutoff Road. A broad belt of landscaping designed to achieve the visual goals of the Project will surround the remaining sides of the plant. The displacement of agriculture on portions of the Site is less than significant because the Site is in an area that is designated and zoned for industrial development. There will be no loss of lands designated or zoned for agriculture. Furthermore, the impact of zoning Prime Farmland with industrial use has already been evaluated by the City of Avenal when it adopted its General Plan

eliminating the need to analyze the impact of building on Prime Farmland in accord with its zoning classification in this particular instance.

The water line interconnections to the existing groundwater wells will traverse Prime Farmlands and Williamson Act contract lands. The water line routes have been designed in consultation with Kochergen Farms to minimize conflict with agricultural operations. The water line routes primarily follow the edges of fields outside the limits of the areas normally planted. Based on the linear nature of the pipelines and their placement in a manner not to impact farming operations, impact on Prime Farmlands will be less than significant.

Federal and state ambient air quality standards have been established to protect not only human health, but to prevent damage to plants and wildlife in both natural and agricultural ecosystems. The two Project-related criteria pollutants with the greatest potential for effects on these ecosystems are ozone (O_3) and NO_2 . Only NO_2 will be emitted directly, generated by the combustion of fuels. Ozone is generated over many hours and miles by a complex series of chemical reactions between nitrogen oxides (NO_x) and reactive organic compounds (ROC). As discussed below, potential effects of Project emissions on agricultural or natural plants, or on wildlife, will be below a level of significance. Additional detail is provided in Section 6.2 - Air Quality.

For both O_3 and NO_2 , national secondary ambient air quality standards, specifically designated to protect against effects other than human health, were set equal to primary ambient air quality standards. Studies have shown that concentrations of these pollutants in excess of ambient air quality standards are needed to produce significant impacts on sensitive plants (Heck and Brandt, 1977). For example, the lowest 4-hour average NO_2 concentration needed to affect sensitive plants is 3,760 micrograms per cubic meter ($\mu g/m^3$). The California 1-hour NO_2 ambient air quality standard is 470 microgram per cubic meter ($\mu g/m^3$) (United States Environmental Protection Agency, 1980). Based on results of the air quality analysis, maximum ground-level ambient concentrations of NO_2 due to Project operations will be lower than ambient air quality standards. Therefore, no significant impact on agricultural or natural plant species is expected to occur from Project emissions.

Similarly, concentrations higher than ambient air quality standards are needed to produce significant effects on animals. For example, 940 $\mu g/m^3$ of NO_2 was used for 4 hours to degranulate lung mast cells in rats (Coffin and Stokinger, 1977). As discussed in Section 6.2 - Air Quality, the maximum ground-level ambient air quality concentrations of NO_2 expected to result from the

Project are substantially lower than ambient air quality standards. Therefore, no significant impact on wildlife or domestic animal species is expected to occur from Project emissions.

The air quality analysis demonstrates that Project emissions will not result in significant impacts to nearby agricultural uses (see Section 6.2 - Air Quality). Therefore, the characteristics of productivity of agricultural lands near the Site will not be significantly impacted by Project operation.

6.4.2.3 Cumulative Impacts

The list of activities with potential for cumulative impacts is provided in Section 6.1.4. With the exception of the City of Avenal water turnout relocation, none of the activities with potential for cumulative impacts is located close enough to have cumulative direct impacts to agriculture. Furthermore, while the water turnout relocation will occur nearby, the relocation will not have a direct impact on agriculture. The City water turnout relocation will occur primarily within the canal right-of-way where there is no agricultural planting. Consequently, there will be no potential for cumulative direct impacts.

The primary potential cumulative indirect impact is through cumulative air emissions. With proposed operations under the regulatory oversight of the SJVUAPCD, cumulative air emissions will not adversely impact agricultural use. Air emission control equipment utilized for the Project will be implemented to reduce potential cumulative impacts to air quality during plant operations.

6.4.2.4 Project Design Features

The following are design and/or operational features that have been incorporated into the Project that help to limit impacts to agriculture and soils to a level that is less than significant:

- Soils will be moisture-conditioned during grading, and roads and laydown areas will be watered during construction activities. This will minimize windblown dust.
- A detailed erosion control plan will be developed prior to Project construction as part of compliance with the state NPDES permits for construction and industrial activities. The plan will include BMP sediment control measures appropriate for the Site.
- A construction grading plan will be prepared in accordance with local guidelines and the Storm Water Pollution Prevention Plan.

- The water line interconnections to existing groundwater wells have been designed in consultation with Kochergen Farms to minimize conflict with agricultural operations. The water line routes primarily follow the edges of fields outside the limits of the areas normally planted.
- Air emission control equipment will be installed to reduce power plant emissions that could affect agricultural uses.

6.4.3 MITIGATION MEASURES

Based on the analysis of potential impacts and Project design and operational features, no mitigation measures are required.

6.4.4 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Based on the above analysis of impacts and Project design and operational features, no significant unavoidable adverse impacts will occur to agriculture or soils.

6.4.5 LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

LORS pertaining to agriculture and soils are identified in Table 6.4-2, along with names of the administrative agencies and the Project's approach to compliance. Construction and operation of the Project will comply with applicable LORS related to agriculture and soil issues through a three-fold process that includes Storm Water Pollution Prevention Plans for construction and operation, a construction grading and drainage plan, and a comprehensive erosion control plan. These measures simultaneously satisfy appropriate local ordinances and state regulations, as summarized in Table 6.4-2.

There are no permits or approvals required for the Project related to Agriculture. There is no agricultural agency that would have authority over the Project if not for the authority of the Commission to certify sites. The Kings County and Fresno County Agricultural Commissioners were contacted during project planning. Contact information is provided in Table 6.4-3. Section 6.5.5 discusses the schedule for filing NOIs to comply with the State General NPDES Permits for storm water runoff from construction and operations.

TABLE 6.4-2
AGRICULTURE AND SOILS LORS AND COMPLIANCE

JURIS- DICTION	LORS/AUTHORITY	ADMINISTERING AGENCY	REQUIREMENTS/ COMPLIANCE	APPROACH TO COMPLIANCE ⁽¹⁾	AFC SECTION
Federal	Federal Water Pollution Control Act of 1972; Clean Water Act of 1977 (including 1987 amendments).	Central Valley RWQCB under direction of SWRCB.	Meet discharge requirements relative to sediment due to accelerated erosion.	Perform construction and operations under NPDES General Permits for construction and Industrial Activities, respectively.	Sections 2.3.17, 6.4.2.1, 6.4.2.2, 6.4.2.4, 6.5.1.2, 6.5.2.1.2, 6.5.2.2.2 Pages 2-72 through 2-77, 6.4-9, 6.4-11, 6.5-3, 6.5-5, 6.5-21, 6.5-22, 6.5-25
	U.S. Department of Agriculture, Soil Conservation Service (SCS), <i>National Engineering Handbook</i> (1983) §2 and 3.	National Resources Conservation Service (formerly Soil Conservation Service).	Standards for planning, design and construction of soil conservation practices.	SCS guidance is considered in project design. The soils that occur at the site and linear corridors do not pose a hazard to the project.	Section 6.4.1.1 Table 6.4-1 Pages 6.4-2, 6.4-4
State	PRC §25523(a); CCR §1752, 1752.5, 2300-2309 and Chapter 2, Subchapter 5, Article I, Appendix B, Part (i)	California Energy Commission.	Submission of information to Commission concerning potential environmental impacts.	Submission of AFC.	Section 6.4 Pages 6.4-1 through 6.4-12
	PRC §21000 et seq.; Guidelines for Implementation of CEQA, 14 CCR §15000-15387, Appendix G.	California Energy Commission.	Evaluate erosion or siltation and conversion of agricultural lands.	Site is zoned Industrial. Linear facilities are designed to minimize impact to lands zoned agricultural, including Prime Farmlands. There will be no loss of lands zoned for agriculture. The Project will reduce erosion compared to existing conditions.	Sections 6.4, 6.4.1.1, 6.4.1.2, 6.4.2.1, 6.4.2.2, 6.4.2.4 Pages 6.4-1 through 6.4-12
	California Porter-Cologne Water Quality Control Act of 1972; California Water Code §13260-13269; 23 CCR Chapter 9.	California Energy Commission; Central Valley RWQCB; SWRCB.	Protect water quality by appropriate design, sizing and construction of erosion and sediment controls. Obtain waste discharge requirements for potential surface water pollution from project area run-off.	Perform construction and operations under NPDES General Permits for construction and Industrial Activities, respectively.	Sections 2.3.17, 6.4.2.1, 6.4.2.2, 6.4.2.4, 6.5.1.2, 6.5.2.1.2, 6.5.2.2.2 Pages 2-72 through 2-77, 6.4-9 through 6.4-11, , 6.5-3, 6.5-5, 6.5-21, 6.5-22, 6.5-25
Local	None applicable.	None applicable.	None applicable.	None applicable.	None applicable.
Industry	None applicable.	None applicable.	None applicable.	None applicable.	None applicable.

31161/Rpts/AFC/Tbls&Figs (9/23/01/rm)

⁽¹⁾ Pursuant to CCR Title 20, Appendix B(h)(1)(B): Each agency with jurisdiction to issue applicable permits and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the Commission to certify sites and related facilities.

TABLE 6.4-3
AGENCY CONTACTS FOR AGRICULTURAL RESOURCES

AGENCY AND CONTACT	PERMITTING/APPROVAL AUTHORITY
Kings Agricultural Commissioner and Sealer of Weights and Measures Dennis Bray 680 North Campus Drive Suite 8 Hanford, California 93230 Tel: (559) 582-3211, ext. 2831	Advisory.
Fresno Agricultural Commissioner and Sealer of Weights and Measures Jerry Prieto, Jr. 1730 South Maple Avenue Fresno, California 93702 Tel: (559) 456-7510	Advisory.
City of Avenal Jim Doughty Director of Planning and Development 919 Skyline Boulevard Avenal, California 93204 Tel: (559) 386-5766	Advisory.

6.4.6 REFERENCES

California Department of Conservation (CDC), Farmland Mapping and Monitoring Program. Prime and Unique Farmlands and Important Farmlands Map, La Cima Quadrangle. 1988.

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